



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/648,966

08/27/2003

Ronny Lee Arnold

10971190-3

4710

22879

7590

09/21/2006

HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER

MEONSKE, TONIA L

ART UNIT

PAPER NUMBER

2181

DATE MAILED: 09/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/648,966	Applicant(s) ARNOLD ET AL.	
	Examiner Tonia L. Meonske	Art Unit 2181	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2003 and 7 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,8-10,12,13,16 and 20-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 5, 8-10,12,13,16 and 20, 23 and 27 is/are rejected.
- 7) ☒ Claim(s) 4,21,22,24-26 and 28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>4/7/06 and 8/27/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. [1] as follows:

2. It is noted that this application appears to claim subject matter disclosed in prior Application No. 09/493,986, filed 1/28/2000, now US Patent 6,715,060. A reference to the prior application must be inserted as the first sentence(s) of the specification of this application or in an application data sheet (37 CFR 1.76), if applicant intends to rely on the filing date of the prior application under 35 U.S.C. 119(e), 120, 121, or 365(c). See 37 CFR 1.78(a). For benefit claims under 35 U.S.C. 120, 121, or 365(c), the reference must include the relationship (i.e., continuation, divisional, or continuation-in-part) of all nonprovisional applications. If the application is a utility or plant application filed under 35 U.S.C. 111(a) on or after November 29, 2000, the specific reference to the prior application must be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. If the application is a utility or plant application which entered the national stage from an international application filed on or after November 29, 2000, after compliance with 35 U.S.C. 371, the specific reference must be submitted during the pendency of the application and within the later of four months from the date on which the national stage commenced under 35 U.S.C. 371(b) or (f) or

Art Unit: 2181

sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(2)(ii) and (a)(5)(ii). This time period is not extendable and a failure to submit the reference required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121 and 365(c). A benefit claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed benefit claim under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition must be accompanied by (1) the reference required by 35 U.S.C. 120 or 119(e) and 37 CFR 1.78(a)(2) or (a)(5) to the prior application (unless previously submitted), (2) a surcharge under 37 CFR 1.17(t), and (3) a statement that the entire delay between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was unintentional. The petition should be addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

3. If the reference to the prior application was previously submitted within the time period set forth in 37 CFR 1.78(a), but not in the first sentence(s) of the specification or an application data sheet (ADS) as required by 37 CFR 1.78(a) (e.g., if the reference was submitted in an oath or declaration or the application transmittal letter), and the information concerning the benefit claim was recognized by the Office as shown by its inclusion on the first filing receipt, the petition under 37 CFR 1.78(a) and the surcharge under 37 CFR 1.17(t) are not required. Applicant is still required to submit the reference

Art Unit: 2181

in compliance with 37 CFR 1.78(a) by filing an amendment to the first sentence(s) of the specification or an ADS. See MPEP § 201.11.

4. In the two page transmittal letter submitted with the original filing of the instant application, it appears that applicant has attempted to amend the specification on the bottom of page 1 to comply with the priority requirements of 37 CFR 120. Applicant is directed to MPEP 714 (37 CFR 1.121), which states that if there are any amendments to the specification, then this section must begin on a separate sheet and entitled "Amendments to the Specification". This section should include all amendments to the specification including amendments to the abstract of the disclosure. Appropriate correction is required. MPEP 714 is included below for Applicants' convenience:

II. MANNER OF MAKING AMENDMENTS >UNDER 37 CFR 1.121<

*All amendments filed on or after July 30, 2003 must comply with 37 CFR 1.121 as revised in the notice of final rule making published in the Federal Register on June 30, 2003 at 65 Fed. Reg. 38611. The manner of making amendments has been revised to assist in the implementation of beginning-to-end electronic image processing of patent applications. Specifically, changes have been made to facilitate electronic image data capture and processing and streamline the patent application process. If an amendment filed on or after July 30, 2003 does not comply with revised 37 CFR 1.121, the Office will notify applicants via a Notice of Non-Compliant Amendment that the amendment is not accepted. ***

The revised amendment practice is summarized as follows.

Amendment Sections

Each section of an amendment document (e.g., Specification Amendments, Claim Amendments, Drawing Amendments, and Remarks) must begin on a separate sheet to facilitate separate indexing and electronic scanning of each section of an amendment document for placement in an image file wrapper. It is recommended that applicants use the following format when submitting amendment papers. The amendment papers should include, in the following order: a cover sheet, or introductory comments, providing the appropriate application information (e.g., application number, applicant, filing date) and which serves as a table of contents to the amendment document by indicating on what page of the amendment document each of the following sections begin;

a section (must begin on a separate sheet) entitled "Amendments to the Specification" (if there are any amendments to the specification). This section should include all amendments to the specification including amendments to the abstract of the disclosure; a section (must begin on a separate sheet) entitled "Amendments to the Claims" which includes a complete listing of all claims ever presented in the application (if there are any amendments to the claims); a section (must begin on a separate sheet) entitled "Amendments to the Drawings" in which all changes to the drawings are discussed (if there are any amendments to the drawings); a remarks section (must begin on a separate sheet); and

Art Unit: 2181

any drawings being submitted including any "Replacement Sheet," "New Sheet," or "Annotated Sheet."

Amendments to the Specification

Amendments to the specification, other than the claims, computer listings (37 CFR 1.96) and sequence listings (37 CFR 1.825), must be made by adding, deleting or replacing a paragraph, by replacing a section, or by a substitute specification. In order to delete, replace or add a paragraph to the specification of an application, the amendment must unambiguously identify the paragraph to be modified either by paragraph number (see MPEP § 608.01), page and line, or any other unambiguous method and be accompanied by any replacement or new paragraph(s).

Replacement paragraphs must include markings to show the changes. A separate clean version of any replacement paragraphs is not required. Any new paragraphs must be presented in clean form without any markings (i.e., underlining).

Where paragraph numbering has been included in an application as provided in 37 CFR 1.52(b)(6), applicants can easily refer to a specific paragraph by number when presenting an amendment. If a numbered paragraph is to be replaced by a single paragraph, the added replacement paragraph should be numbered with the same number of the paragraph being replaced. Where more than one paragraph is to replace a single original paragraph, the added paragraphs should be numbered using the number of the original paragraph for the first replacement paragraph, followed by increasing decimal numbers for the second and subsequent added paragraphs, e.g., original paragraph [0071] has been replaced with paragraphs [0071], [0071.1], and [0071.2]. If a numbered paragraph is deleted, the numbering of the subsequent paragraphs should remain unchanged.

37 CFR 1.121(b)(1)(ii) requires that the full text of any replacement paragraph be provided with markings to show all the changes relative to the previous version of the paragraph. The text of any added subject matter must be shown by underlining the added text. The text of any deleted subject matter must be shown by strike-through except that double brackets placed before and after the deleted characters may be used to show the deletion of five or fewer consecutive characters (e.g., [[error]]). >The term "brackets" set forth in 37 CFR 1.121 means square brackets – [], and not parentheses – ().<The text of any deleted subject matter must be shown by being placed within double brackets if strike-through cannot be easily perceived (e.g., deletion of the number "4" must be shown as [[4]]). As an alternative to using double brackets, however, extra portions of text may be included before and after text being deleted, all in strike-through, followed by including and underlining the extra text with the desired change (e.g., _____ number 4 as number 14 as). For added paragraphs, 37 CFR 1.121(b)(2)(iii) requires that the full text of any added paragraph(s) be presented in clean form without any underlining. Similarly, under 37 CFR 1.121(b)(2)(iv), a marked up version does not have to be supplied for any deleted paragraph(s). It is sufficient to merely indicate or identify any paragraph that has been deleted. The instruction to delete may identify a paragraph by its paragraph number, page and line number, or include a few words from the beginning, and end, of the paragraph, if needed for paragraph identification.

Applicants are also permitted to amend the specification by replacement sections (e.g., as provided in 37 CFR 1.77(b), 1.154(b), or 1.163(c)). As with replacement paragraphs, the amended version of a replacement section is required to be provided with markings to show all the changes relative to the previous version of the section. The text of any added subject matter must be shown by underlining the added text. The text of any deleted subject matter must be shown by strike-through except that double brackets placed before and after the deleted characters may be used to show the deletion of five or fewer consecutive characters. The text of any deleted subject matter must be shown by being placed within double brackets if strike-through cannot be easily perceived.

Applicants are also permitted to amend the specification by submitting a substitute specification, provided the requirements of 37 CFR 1.125(b) and (c) are met. >Under

Art Unit: 2181

*37 CFR 1.125, a clean version of the substitute specification, a separate marked up version showing the changes in the specification relative to the previous version **>, and a statement that the substitute specification contains no new matter are required.*

Any previously deleted paragraph or section can only be reinstated by a subsequent amendment presenting the previously deleted subject matter. A direction by applicant to remove a previously entered amendment will not be permitted.

Double Patenting

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

6. A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

7. Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1, 3-5, 8-10, 12, 13, 16, 20-28 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 1, 2, 4, 5, 6, 7, 8, 9, 11, 3, 2, 10, 19, 20, 21, 26, 23 and 27, respectively of U.S. Patent No. 6, 715, 060.

9. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

- a. The claims of the instant application 1, 3, 4, 5, 8, 9, 10, 12, 13, 16, 20, 21, 22 are anticipated by the patented claims 1, 1, 2, 4, 5, 6, 7, 8, 9, 11, 3, 2, and 10,

respectively, in that the patented claims contain all of the limitations of claims of the instant application (In claim 8, the predicate status associated with said one instruction is equivalent to "indicating whether said one instruction may be cancelled" in claim 12 of US Patent 6,715,060.). The claims of the instant application therefore are not patently distinct from the earlier patent claims and as such are unpatentable for obvious-type double patenting.

b. In claim 21, the second bit indicates/detects whether said pending write may be cancelled, whereas in claim 2 of the patent the indication/detection is based on said plurality of bits. The second bit is necessarily included in the plurality of bits and therefore the indication is performed by detecting both the first and second bits, in claim 2 of the patent. Therefore the indicator to detect whether said pending write may be cancelled, as in claim 21, is at least the second bit in order to anticipate claim 2 of the patent.

c. Claim 23 is anticipated by claim 19 of the patent, except that claim 23 has additional circuitry to cancel at least one of said retired instruction based on said data. However, claim 19 contains circuitry and data indicating which of said retired instruction may be canceled. It would not make any sense to keep track of which instructions could be cancelled, unless there was actual circuitry to cancel instructions that can be cancelled. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the computer system of claim 19 of the patent include circuitry configured to cancel at least one of said retired instruction based on said data, as in claim 23, for the

Art Unit: 2181

desirable purpose of making use of the indicators that determine whether instructions can be cancelled so that unnecessary instructions are cancelled from full execution and commitment.

10. Claims 24, 25 and 26 depend from claim 23. Each and every limitation of claims 24, 25 and 26 are anticipated by 20, 21 and 26 of the patent.

11. Claim 27 is anticipated by claim 23 of the patent, except that claim 27 cancels at least one of said retired instructions based on said scoreboard. However, claim 23 contains circuitry and data indicating which of said retired instructions may be canceled. It would not make any sense to keep track of which instructions could be cancelled in the scoreboard, unless at least one of said retired instructions could be cancelled.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the computer system of claim 23 of the patent include canceling at least one of said retired instruction based on the scoreboard, as in claim 27, for the desirable purpose of making use of the indicators that determine whether instructions can be cancelled so that unnecessary instructions are cancelled from full execution and commitment.

12. Claim 28 is anticipated by claim 23 of the patent, except that claim 28 cancels the instruction based on reading said multi-bit register in the scoreboard. However, it would not make sense to store data in the scoreboard indicating that an instruction could be cancelled and subsequently canceling the instruction, unless the multi-bit register was read and checked to see whether the instruction should actually be cancelled. Therefore it would have been obvious to one of ordinary skill in the art at the

Art Unit: 2181

time the invention was made to have the system of claim 23 of the patent cancel the retired instruction based on reading said multi-bit register of the scoreboard, for the desirable purpose of making use of the indicators that determine whether instructions can be cancelled so that unnecessary instructions are easily cancelled from full execution and commitment.

Claim Rejections - 35 USC § 112

13. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

14. Claims 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

15. Claim 3 recites the limitation "said data associated with said one instruction" in line 2. There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

17. Claims 1, 5 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Pomerene et al., US Patent 4,903,196 (herein after "Pomerene").

Art Unit: 2181

18. Referring to claim 1, Pomerene has taught a computer system for processing instructions of a computer program, comprising:

- a. a plurality of pipelines configured to process and execute said instructions (column 4, lines 29-41, Figure 3, "n" execution units); and
- b. a scoreboard coupled to said pipelines, said scoreboard having a plurality of multi-bit registers (Figure 2, column 4, lines 5-60, column 5, lines 61-68, column 6, line 32-column 7 line 41, The tags comprise a multi-bit register. All of the multi-bit registers comprise the scoreboard.), said scoreboard configured to receive a register identifier from one of said pipelines and to change a first bit in one of said multi-bit registers in response to said register identifier, said first bit indicating whether a pending write to a register identified by said register identifier exists (column 5-8, The "Sink Forward Tag" indicates whether a pending write to a register exists. The scoreboard must inherently receive the Register ID's in order for the scoreboard to maintain current register status values for each register in the corresponding tags.), said register identifier associated with one of said instructions processed by said pipeline (column 5, lines 49-68, Each register identifier is associated with an execution unit in the pipeline executing an instruction.), said scoreboard further configured to control a second bit in said one register based on whether an instruction for reading data retrieved by said pending write has been detected during said pending write (Column 7, lines 15-24, and column 7, line 65-column 8, line 9, column 13, lines 10-20, The "Source Tag" indicates which execution unit is writing a value into a

Art Unit: 2181

register as a sink immediately preceding the current request use of the register as a source. In order for the scoreboard to maintain the current source tag for each register, the scoreboard must have inherently detected the instruction for reading said data during said pending write.).

19. Referring to claim 5, Pomerene has taught the system of claim 1, as described above and further comprising circuitry coupled to said scoreboard, said circuitry configured to detect a data hazard based on said first and second bits (column 13, lines 10-28, column 4, lines 45-60).

20. Referring to claim 20, Pomerene has taught the system of claim 1, as described above, and further comprising circuitry configured to transmit said register identifier to said scoreboard in response to a determination that said one instruction is retired while said pending write exists (column 13, lines 16-20, column 11, lines 32-51, column 8, lines 28-36, The definition of retire is to finish execution of the instruction. This definition is supported by Applicant's own specification on page 9, lines 17-24. In the invention of Pomerene, when an instruction finishes execution, or the instruction is retired, the scoreboard must be updated. The pending write, waiting for an instruction to retire, is further executed and the scoreboard is updated accordingly.).

21. Claims 23 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Ramagopal et al., US Patent 5,838,943 (herein after Ramagopal).

22. Referring to claim 23, Ramagopal has taught a system for processing instructions of a computer program, comprising:

Art Unit: 2181

- a. a plurality of pipelines configured to process and execute said instructions (Figure 1, column 5, lines 1-15, decode units, reservation stations and functional units);
- b. a scoreboard coupled to said pipelines (Figure 2, element 26, Load/Store Unit is the scoreboard), said scoreboard indicative of which of a plurality of registers are associated with pending writes induced by retired instructions (column 5, line 34-column 6, line 48, column 15, lines 24-31, The definition of retire is to finish execution of the instruction. This definition is supported by Applicant's own specification on page 9, lines 17-24. Instructions stored in the Load/Store unit are associated with their respective store registers. When speculative store instructions finish executing they are considered retired, but they are in the load/store unit until they complete and are non-speculative. Speculative store instructions that are finished executing are stored in the load store unit and are considered pending. So the pending writes are caused by the instruction finishing executing, or retiring, but not being able to complete.), said scoreboard comprising data indicative of which of said retired instructions may be canceled (column 5, line 34-column 6, line 48, Column 15, line 26-column 16, line 42, All speculative stores stored in the Load/Store unit may be cancelled.); and
- c. circuitry configured to cancel at least one of said retired instructions based on said data (column 5, line 34-column 6, line 48, Column 15, line 26-column 16,

Art Unit: 2181

line 42, When the Load/Store unit is restored due to a branch misprediction, then the speculative stores following the misprediction are cancelled.).

23. Referring to claim 27, Ramagopal has taught a method for processing instructions of a computer program, comprising the steps of:

- a. processing and executing instructions via a plurality of pipelines (Figure 1, column 5, lines 1-15, decode units, reservation stations and functional units);
- b. updating a scoreboard such that said scoreboard indicates which of a plurality of registers are associated with pending writes induced by retired instructions (column 5, line 34-column 6, line 48, column 15, lines 24-31, The definition of retire is to finish execution of the instruction. This definition is supported by Applicant's own specification on page 9, lines 17-24. Instructions stored in the Load/Store unit are associated with their respective store registers. When speculative store instructions finish executing they are considered retired, but they are in the load/store unit until they complete and are non-speculative. Speculative store instructions that are finished executing are stored in the load store unit and are considered pending. So the pending writes are caused by the instruction finishing executing, or retiring, but not being able to complete.);
- c. updating said scoreboard such that said scoreboard indicates which of said retired instructions may be canceled (column 5, line 34-column 6, line 48, Column 15, line 26-column 16, line 42, All speculative stores stored in the Load/Store unit may be cancelled.); and

Art Unit: 2181

d. canceling at least one of said retired instructions based on said scoreboard (column 5, line 34-column 6, line 48, Column 15, line 26-column 16, line 42, When the Load/Stored unit is restored due to a branch misprediction, then the speculative stores following the misprediction are cancelled.).

24. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

25. The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

26. Claims 8, 9, 10, 12, 13 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Arora, US Patent 6,219,781 (herein after Arora).

27. Referring to claim 8, Arora has taught a method for processing instructions of a computer program, comprising the steps of:

a. providing a pipeline and a scoreboard (Figures 1A, 1B and 1C, Figure 3, element 301 is the pipeline, column 1, lines 22-30, column 6, lines 22-33, column 7, line 60-column 8, line 14, the scoreboard is comprised of at least elements

Art Unit: 2181

100, 101, 102 and 103), said scoreboard including a plurality of multi-bit registers (column 6, lines 22-33, at least the register ID, status bits, predicate ID and predicate status bits);

b. processing one of said instructions via said pipeline (column 3, lines 33-35, and line 37-44);

c. detecting that data produced via execution of said one instruction is unavailable (column 3, lines 33-44, While a producer instruction is executing, the data is unavailable to the consumer instruction and the scoreboard is updated to indicate the data is pending and unavailable.);

d. detecting a pending instruction for reading said data (column 3, lines 33-35, the add instruction); and

e. updating one of said multi-bit registers based on each of said detecting steps such that said one multi-bit register indicates an existence of a pending write associated with said one instruction (Figure 1B, A row in the scoreboard is a multi-bit register. A "pending" status indicates the existence of a pending write instruction to a register.) and a predicate status associated with said one instruction (Figure 1A, elements 102 and 103, column 7, line 60-column 8, line 14).

28. Referring to claim 9, Arora has taught the method of claim 8, as described above and further comprising the step of detecting a data hazard based on said one multi-bit register (Figure 2, element 230, column 9, lines 5-19, A hazard is detected, based on

Art Unit: 2181

the register status in the multi-bit register and the predicate value of the consumer instruction, and a hazard signal is sent.).

29. Referring to claim 10, Arora has taught the method of claim 8, as described above and further comprising the step of indicating, via said one multi-bit register, a speculative state of said one instruction (Figure 1A, column 4, line 26-column 5, lines 13, The "speculative scoreboard" indicates speculative registers of speculative instructions.).

30. Referring to claim 12, Arora has taught the method of claim 8, as described above and further comprising the steps of:

- a. retiring said one instruction (column 4, lines 41-column 5, line 5, An instruction is executed.); and
- b. transmitting a register identifier defined by said one instruction to said scoreboard, wherein said updating step is based on said retiring step (column 4, lines 41- column 5, line 5, When an instruction and associated registers are determined to have been properly executed, then the registers associated with it are updated in the non-speculative scoreboard and the instruction completes. The register identified must be transmitted so that the value can be looked up, along with its' associated status, and updated accordingly.).

31. Referring to claim 13, Arora has taught the method of claim 8, as described above and further comprising the steps of:

- a. receiving data (column 4, lines 41-64, The speculative register scoreboard receives the register ID of an executing load instruction.) and;

Art Unit: 2181

- b. updating, said one multi-bit register in response to said receiving step (column 4, lines 41-64, The register ID of the producer register is entered into the speculative register scoreboard.).

32. Referring to claim 16, Arora has taught the method of claim 8, as described above and further comprising the steps of: transmitting a register identifier defined by said one instruction to said scoreboard (column 4, lines 41-64, The register ID of an executing load instruction is transmitted to the speculative register scoreboard.); and selecting said one register based on said register identifier, wherein said updating is performed based on said selecting step (Figure 1B, The register ID is selected and the status is updated to pending.).

Allowable Subject Matter

33. Claim 3 is objected to as being dependent upon a rejected base claim and rejected under 35 U.S.C. 112, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and the 35 U.S.C. 112 problem corrected.

34. Claims 4, 21, 22, 24, 25, 26 and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

35. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tonia L. Meonske whose telephone number is (571)

Art Unit: 2181

272-4170. The examiner can normally be reached on Monday-Friday with first Friday's off.

36. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fritz Fleming can be reached on (571) 272-4145. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

37. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

tlm

TONIA L. MEONSKE

Tonia L. Meonske

09/15/2006